

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 630 (2005): Bicycle Spokes (Plain) and Nipples for Spokes - Specification [TED 16: Bicycles]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक
साइकिल की स्पोकें (प्लेन) और स्पोक निपलें — विशिष्टि
(तीसरा पुनरीक्षण)

Indian Standard
BICYCLE SPOKES (PLAIN) AND NIPPLES
FOR SPOKES — SPECIFICATION
(*Third Revision*)

ICS 43.150

© BIS 2005

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZADEGATE
NEW DELHI 11000

October 2005

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Bicycles Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was originally published in 1955 and was revised in 1961 and then in 1982. The experience gained in the manufacture of components and the revision of the reference standards have necessitated the present revision of the standard. In this revision spokes and nipples for wire diameter 2.3 mm and 2.6 mm have also been included.

In the preparation of this standard considerable assistance has been drawn from the following International Standards:

- a) JIS D 9420 : 1994 Spokes for bicycles, and
- b) ISO 6701 : 1991 Cycles — External dimensions of spoke nipples.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**AMENDMENT NO. 1 DECEMBER 2008
TO
IS 630 : 2005 BICYCLE SPOKES (PLAIN)
AND NIPPLES FOR SPOKES —
SPECIFICATION**

(*Third Revision*)

(Page 1, clause 3.1.2) — Substitute the following for the existing:

‘The nipples shall be manufactured from brass conforming to IS 2704 or steel conforming to IS 8564.’

(TED 16)

Reprography Unit, BIS, New Delhi, India

Indian Standard

BICYCLE SPOKES (PLAIN) AND NIPPLES FOR SPOKES — SPECIFICATION

(Third Revision)

1 SCOPE

This standard specifies the requirements of bicycle spokes (Plain) and nipples and washers intended for use with them.

2 REFERENCES

The following standards contain provisions, which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
513 : 1994	Cold rolled carbon steel sheets and strips — Specification (<i>fourth revision</i>)
629 : 1988	Specification for bicycle hub assembly, R-type (<i>second revision</i>)
1068 : 1993	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium — Specification
1359 : 1992	Electroplated coatings of tin— Specification (<i>third revision</i>)
1573 : 1986	Specification for electroplated coatings of zinc on iron and steel (<i>second revision</i>)
2500 (Part 1) : 2000	Sampling procedures for inspection by attributes: Part 1 Sampling schemes indexed by Acceptable Quality Limit (AQL) for lot-by-lot inspection (<i>third revision</i>)
2704 : 1983	Specification for brass wire for cold-headed and machined parts (<i>first revision</i>)
6902 : 1973	Specification for steel wire for spokes
8564 : 1977	Specification for steel wire for nipples for spokes
12205 : 1988	Specification for bicycle hub assembly — PH-type

3 REQUIREMENTS

3.1 Material

3.1.1 Spokes

The spokes shall be manufactured from steel wire conforming to IS 6902.

3.1.2 Nipples

The nipples shall be manufactured from brass conforming to the chemical composition specified in IS 2704 or steel conforming to IS 8564.

3.1.3 Washers

The washers, where used, shall be made from steel sheets conforming to IS 513.

3.2 Dimensions

3.2.1 Spokes

The spokes shall be manufactured to the dimensions and limits specified in Table 1. Length 'L' of spokes shall be as specified by the purchaser to suit the particular type of wheel or wheels for which the spokes are intended to be used.

NOTE — The above dimensions of the spokes suit the hubs according to IS 629 and IS 12205.

3.2.1.1 The threads shall conform to the dimensions as specified in Table 1.

3.2.2 Nipples

The nipples shall be manufactured according to the dimensions and limits specified in Table 2.

3.2.2.1 The hole in the nipple shall be drilled centrally through the head and threaded in accordance with the requirements given in Table 2.

3.2.3 Washers

The washers shall be manufactured according to the dimensions and limits shown in Fig. 1. They shall be free from burrs.

NOTE — The washers may or may not be provided depending on the rim used

3.3 Finish

3.3.1 The spokes may be galvanized or zinc or nickel-

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Bicycles Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was originally published in 1955 and was revised in 1961 and then in 1982. The experience gained in the manufacture of components and the revision of the reference standards have necessitated the present revision of the standard. In this revision spokes and nipples for wire diameter 2.3 mm and 2.6 mm have also been included.

In the preparation of this standard considerable assistance has been drawn from the following International Standards:

- a) JIS D 9420 : 1994 Spokes for bicycles, and
- b) ISO 6701 : 1991 Cycles — External dimensions of spoke nipples.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BICYCLE SPOKES (PLAIN) AND NIPPLES FOR SPOKES — SPECIFICATION

(Third Revision)

1 SCOPE

This standard specifies the requirements of bicycle spokes (Plain) and nipples and washers intended for use with them.

2 REFERENCES

The following standards contain provisions, which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
513 : 1994	Cold rolled carbon steel sheets and strips — Specification (<i>fourth revision</i>)
629 : 1988	Specification for bicycle hub assembly, R-type (<i>second revision</i>)
1068 : 1993	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium — Specification
1359 : 1992	Electroplated coatings of tin— Specification (<i>third revision</i>)
1573 : 1986	Specification for electroplated coatings of zinc on iron and steel (<i>second revision</i>)
2500 (Part 1) : 2000	Sampling procedures for inspection by attributes: Part 1 Sampling schemes indexed by Acceptable Quality Limit (AQL) for lot-by-lot inspection (<i>third revision</i>)
2704 : 1983	Specification for brass wire for cold-headed and machined parts (<i>first revision</i>)
6902 : 1973	Specification for steel wire for spokes
8564 : 1977	Specification for steel wire for nipples for spokes
12205 : 1988	Specification for bicycle hub assembly — PH-type

3 REQUIREMENTS**3.1 Material****3.1.1 Spokes**

The spokes shall be manufactured from steel wire conforming to IS 6902.

3.1.2 Nipples

The nipples shall be manufactured from brass conforming to the chemical composition specified in IS 2704 or steel conforming to IS 8564.

3.1.3 Washers

The washers, where used, shall be made from steel sheets conforming to IS 513.

3.2 Dimensions**3.2.1 Spokes**

The spokes shall be manufactured to the dimensions and limits specified in Table 1. Length 'L' of spokes shall be as specified by the purchaser to suit the particular type of wheel or wheels for which the spokes are intended to be used.

NOTE — The above dimensions of the spokes suit the hubs according to IS 629 and IS 12205.

3.2.1.1 The threads shall conform to the dimensions as specified in Table 1.

3.2.2 Nipples

The nipples shall be manufactured according to the dimensions and limits specified in Table 2.

3.2.2.1 The hole in the nipple shall be drilled centrally through the head and threaded in accordance with the requirements given in Table 2.

3.2.3 Washers

The washers shall be manufactured according to the dimensions and limits shown in Fig. 1. They shall be free from burrs.

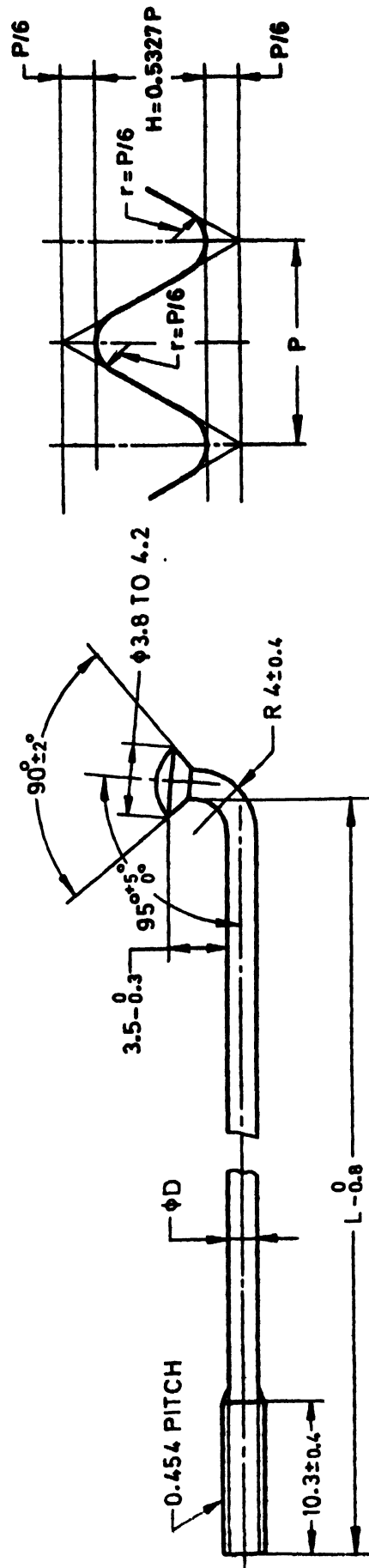
NOTE — The washers may or may not be provided depending on the rim used.

3.3 Finish

3.3.1 The spokes shall be galvanized or zinc or nickel-

Table 1 Dimensions of Bicycle Spokes (Plain)
(Clauses 3.2.1 and 3.2.1.1)

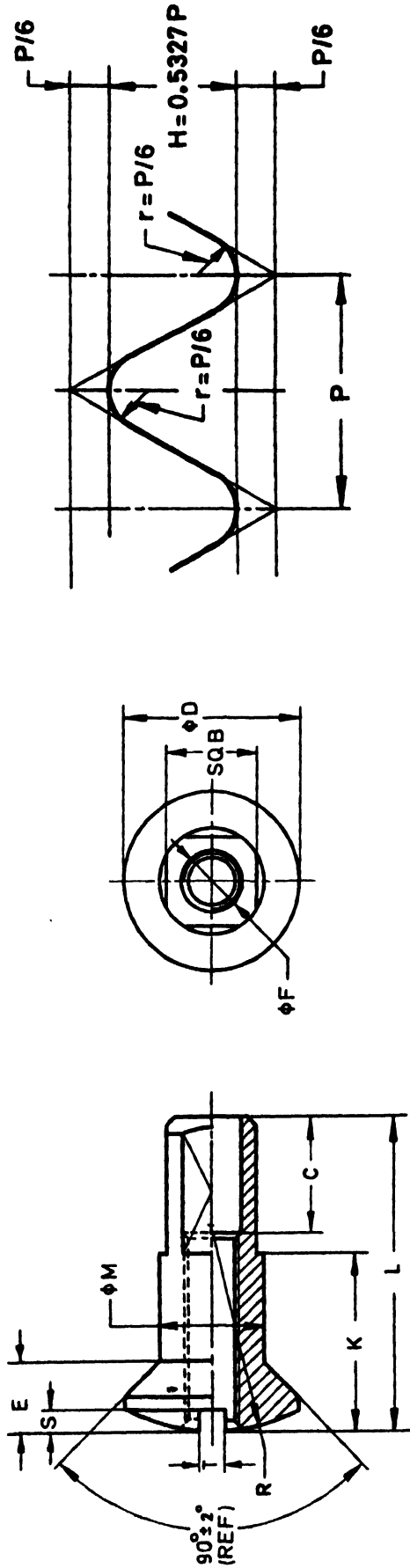
All dimensions in millimetres.



Wire Diameter <i>D</i>	Details of Threads					
	Pitch <i>P</i>	Major Diameter		Effective Diameter		Minor Diameter <i>Max</i>
		<i>Max</i>	<i>Min</i>	<i>Max</i>	<i>Min</i>	
±0.03						
1.8	0.454	2.095	1.994	1.954	1.783	1.813
2.0	0.454	2.299	2.197	2.057	1.985	1.816
2.3	0.454	2.604	2.502	2.362	2.291	2.121
2.6	0.454	2.908	2.807	2.667	2.596	2.426

Table 2 Dimensions of Nipples for Bicycle Spokes
(Clauses 3.2.2 and 3.2.2.1)

All dimensions in millimetres.



Nominal Diameter 'Snoke	Head Dimensions						Body Dimensions						Thread Dimensions					
	D	T	S	R	E	M	B	F	C	L	K	Pitch	Major Diameter	Effective Diameter		Minor Diameter		
	Mfn	+0 -0.2	+0 -0.4	Nom	+0 -0.2	+0 -0.3	+0 -0.1			Mfn	Mfn	P	Mfn	Max	Min	Max	Min	
	6	1.1	1.1	10	2.5	4	3.3	2.2	2.5	11	5.5	0.454	2.095	1.938	1.854	1.783	1.613	
	6	1.1	1.1	10	2.5	4	3.3	2.4	2.5	11	5.5	0.454	2.299	2.141	2.057	1.986	1.816	
	7	1.1	1.1	10	2.7	4.3	3.6	2.7	2.5	11	6.0	0.454	2.604	2.446	2.362	2.291	2.121	
	7.5	1.1	1.1	10	2.7	4.6	4.0	3.0	2.5	12	7.0	0.454	2.908	2.751	2.667	2.596	2.426	

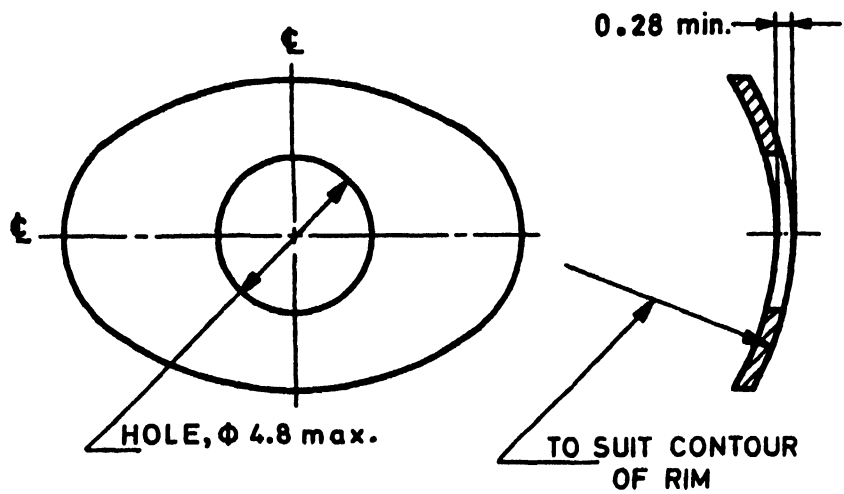


FIG. 1 WASHER FOR NIPPLE (SCHEMATIC)

chrome plated. The minimum thickness of galvanizing shall be 15 microns. In the case of nickel-chrome plating the electroplated coatings shall conform to Service Condition No. 1 with Classification Code Fe/Ni 10b Cr r of IS 1068 with the proviso that p- or d- nickel and mc- or mp- chromium may be substituted for b-nickel and r-chromium, respectively. These thicknesses shall not apply to thread lengths.

3.3.2 The nipple, if manufactured from brass shall be nickel-chrome plated to Service Condition No. 2 with Classification Code Cu/Ni 10b Cr r of IS 1068 and if manufactured from steel shall be zinc plated to Service Condition No. 2 with Classification Code Fe Zn 12 of IS 1573.

3.3.3 The washers shall be zinc plated to Service Condition No. 2 with Classification Code Fe Zn 12 of IS 1573, or shall be tinplated to Service Grade No. 2 with Classification Code Fe Sn8 of IS 1359 or if nickel-chrome plated, the electroplated coatings shall conform to Service Condition No. 1 with Classification Code Fe/Ni 10b Cr r of IS 1068 with the proviso that p- or d- nickel and mc- or mp- chromium may be substituted for b- nickel and r- chromium respectively.

3.4 Appearance

The appearance of spokes and nipples shall be as follows:

- a) There shall be no visible burrs, fins or the like on any part.
- b) Plated surfaces shall be free from exposure of substrate, peeling off, rust and other visible defects.
- c) Non-plated surfaces shall be free from rust, cracks and other visible defects.

4 TESTS

4.1 Reverse Bend Test for Spoke Wire

The spoke wire shall be capable of being bent backwards and forwards not less than three times through an angle of 180° over a radius equal to its own diameter (*see* Fig. 2) without showing signs of fracture. The first bend of 90° shall not be counted.

4.2 Breaking Strength Test for Spokes and Nipples

With a set of spoke and nipple assembled into about 5 mm length of thread engagement, when tested as shown in Fig. 3 to apply a test load, the breaking strength shall not be less than the values given in Table 3.

Table 3 Breaking Strength for Spokes and Nipples

Spoke Wire Diameter	Breaking Strength
mm	N
(1)	(2)
1.8	2 100
2.0	2 600
2.3	3 300
2.6	4 000

5 CRITERIA FOR CONFORMITY

Unless otherwise agreed to between the manufacturer and the purchaser the procedure given in IS 2500 (Part 1) shall be followed. The single sampling plan

to be followed for each characteristic shall be corresponding to the inspection level and AQL as given below:

<i>Characteristic</i>	<i>Inspection Level</i>	<i>AQL</i>
Dimensions, finish and appearance	S-3	2.5
Reverse bend and breaking strength tests	S-1	1.0

6 PACKING

The spokes, washers and nipples shall be wrapped in non-absorbent greased paper and then securely packed in waterproof strong card board carton or packed according to trade practice. Each size shall be kept separate when packed.

7 MARKING

7.1 The spokes and nipples shall have the trade-mark of the manufacturer marked on their heads. Each

package shall be legibly marked with the following:

- Manufacturer's name or trade-mark, if any;
- Description of the contents, that is, size and name of material;
- Batch number;
- Quantity of material;
- Material of nipples (brass or steel); and
- Type of finish.

7.2 BIS Certification Marking

The material may also be marked with the Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to the manufacturers or producers may be obtained from the Bureau of Indian Standards.

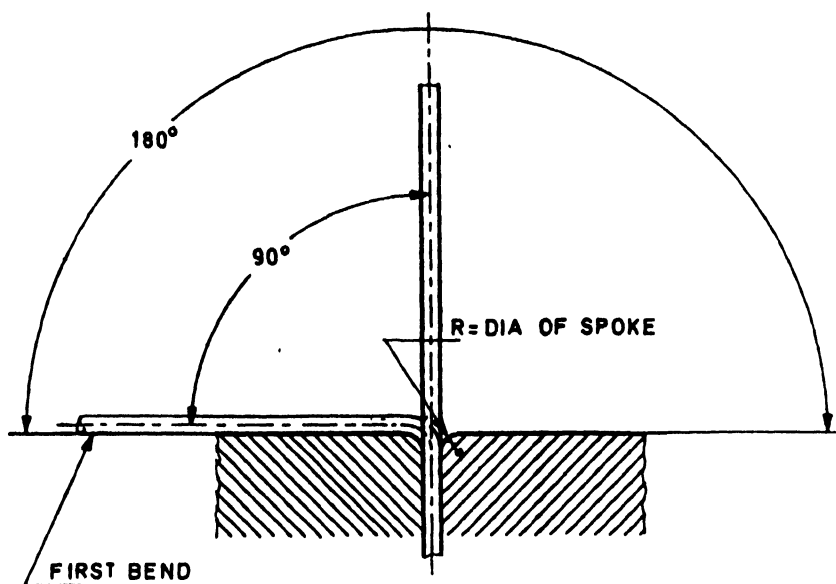


FIG. 2 REVERSE BEND TEST FOR SPOKE WIRE

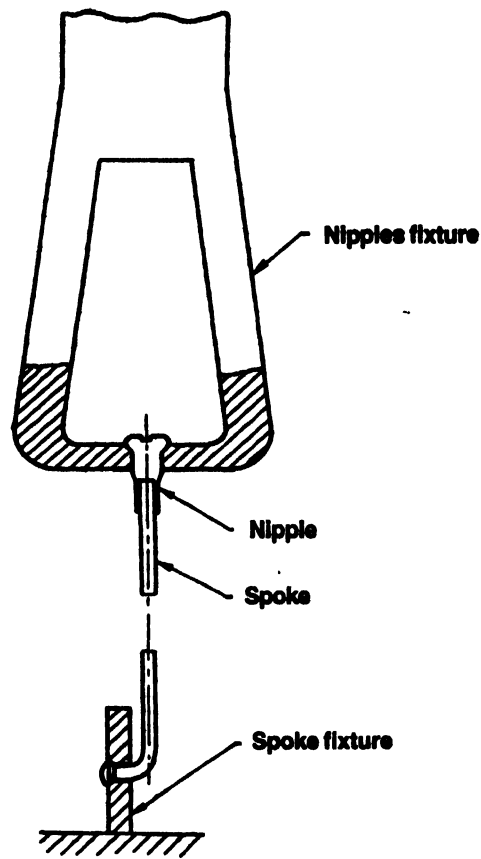


FIG. 3 BREAKING STRENGTH TEST

ANNEX A
(Foreword)
COMMITTEE COMPOSITION
Bicycles Sectional Committee, TED 16

<i>Organization</i>	<i>Representative(s)</i>
Hero Cycles Ltd, Ludhiana	SHRI S.K. RAJ (<i>Chairman</i>) SHRI BRIDMOHAN LAL (<i>Alternate</i>)
Atlas Cycles (Haryana) Limited, Sonapat	SHRI VIKRAM KAPUR SHRI ASHOK KUMAR (<i>Alternate</i>)
Avery Cycle Industries Ltd (Avon Group), Ludhiana	SHRI HARCHARAN SINGH SHRI ASHWANI KUMAR BHAKHAN (<i>Alternate</i>)
Avon Cycles Ltd, Ludhiana	SHRI ONKAR SINGH PAHWA SHRI RISHI PAHWA (<i>Alternate</i>)
Bhogal Sons (Regd), Ludhiana	SHRI HARINDER P. BHOGAL SHRI NAGINDER SINGH BHOGAL (<i>Alternate</i>)
Bicycle & Sewing Machines (R&D Centre), Ludhiana	GENERAL MANAGER SHRI SHAMSHER SINGH (<i>Alternate</i>)
Controllarate of Quality Assurance (Vehicles), Ahmednagar	JOINT CONTROLLER DEPUTY CONTROLLER (<i>Alternate</i>)
Department of Industrial Policy and Promotion, New Delhi	SHRI M. M. ALI KHAN SHRI B. C. NAYAK (<i>Alternate</i>)
Dewan Rubber Industries Ltd, Meerut	SHRI VIVEK DEWAN SHRI C. K. SAXENA (<i>Alternate</i>)
Director of Industries, Punjab, Ludhiana	GENERAL MANAGER SENIOR TECHNICAL OFFICER (<i>Alternate</i>)
Directorate General of Supplies and Disposals, New Delhi	SHRI S. M. MUNJAL SHRI W. M. WANJARI (<i>Alternate</i>)
Directorate of Industries, Government of Haryana, Chandigarh	SHRI R. N. GOYAL SHRI SUNIL CHOPRA (<i>Alternate</i>)
Eastman Industries, Ludhiana	SHRI JAGDEEP SINGH
Govind Rubber Ltd, Distt Ludhiana	SHRI VINOD PODDAR SHRI S. P. SUKHRANI (<i>Alternate</i>)
Hamilton Industries Pvt Ltd, Ambarnath	SHRI M. R. PRAJAPATI SHRI P. R. RAVIKUMAR (<i>Alternate</i>)
Hartex Rubber Ltd, Hyderabad	SHRI K. SUBRAMANIAN SHRI RAVINDRA PANT (<i>Alternate</i>)
J. K. Cycles, Ludhiana	SHRI JOGINDER KUMAR
Kular Cycle Industries, Ludhiana	SHRI AJIT SINGH SHRI DARSHAN SINGH (<i>Alternate</i>)
Metro Tyres Limited, Ludhiana	SHRI L. K. MATHUR SHRI SANJEEV SOOD (<i>Alternate</i>)
Nova Bicycle Industries, Ludhiana	SHRI HARMINDER SINGH PAHWA SHRI ROHIT PAHWA (<i>Alternate</i>)
Office of the Development Commissioner (SSI), New Delhi	SHRI R. L. GARG SHRI M. B. JAYA KUMAR (<i>Alternate</i>)
Ralson (India) Limited, Ludhiana	SHRI SANJEEV PAHWA SHRI T. R. KUKREJA (<i>Alternate</i>)
Sadem Industries, Ludhiana	SHRI SATISH KUMAR DHANDA
Seth Industrial Corporation, Ludhiana	SHRI B. K. SETH
T. I. Cycles of India, Chennai	SHRI S. SADISH KUMAR SHRI V. DURAIRAJ (<i>Alternate</i>)
United Cycle & Parts Manufacturers Association, Ludhiana	PRESIDENT SECRETARY (<i>Alternate</i>)
BIS Directorate General	SHRI S. K. BHATIA, Director & Head (TED) [Representing Director General (<i>Ex-officio Member</i>)]

Member Secretary
SHRI J. M. KHANNA
Joint Director (TED), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. TED 16 (390).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002

Telephones: 2323 0131, 2323 3375, 2323 9402

website : www.bis.org.in

Regional Offices:

Telephones

Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 2323 7617 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	{ 2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 260 3843 260 9285
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 2254 1216, 2254 1442 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 2832 9295, 2832 7858 2832 7891, 2832 7892
Branches	: AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.	